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AGRICULTURAL EXPERIMENT STATION
Pullman, Washington

Division of Home

Baking Vegetables Electrically

by

VeNona W. Swartz

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[1] In cooperation with the State Committee on the Relation of Electricity to Agriculture.
[2] In cooperation with the United States Department of Agriculture.

TABLE OF CONTENTS

Figure 1. Foods Laboratory of the Experiment Station

BAKING VEGETABLES ELECTRICALLY*

By VeNona W. Swartz

INTRODUCTION

Preparing and cooking vegetables is a regularly recurring task in every household. A study of 87 homes in the State of Washington indicated that it is performed on an average of 12 to 15 times weekly. In one home vegetables were cooked and served 31 times in a certain week.

Nutrition experts, dietitians, doctors, and home economists are urging the public to eat more vegetables, both raw and cooked, because they contribute bone and body building minerals, building and protective vitamins, and regulating bulk. In general these advisers recommend that all vegetables that are palatable and digestible raw, be served raw, as in salads. Where cooking is necessary to soften the fibers and make available the minerals and vitamins, as short a cooking period as possible is advocated. Since many of the nutrients are washed out of vegetables when they are cooked in a large quantity of water, it is recommended that they be cooked without water or with a very little, unless such a method makes them strong in flavor or unpleasantly discolored. In this event, the method loses its advantage, for few will eat these unpalatable products. It is better to sacrifice a small percentage of the minerals and vitamins in order to have attractive, appetizing vegetables that are eaten, than to have on the table a dish of superlatively "good-for-you" vegetables that go uneaten because they are disliked.

* The work herein reported was begun at the State College of Washington Agricultural Experiment Station in the fall of 1929, as Home Economics Purnell Project Number 3, entitled "Standards for Cooking Vegetables in the Electric Oven." It was drawn up and a beginning made by Miss Catherine Landreth, and was continued in 1930 by the writer. The purpose was "to establish definite standards for the most efficient and economic utilization of the electric oven for cooking vegetables." A comprehensive detailed report of the experimental work has been prepared, and a bound copy can be borrowed from the State College of Washington Library, at Pullman.

This project was made possible through cooperation with the Agricultural Engineering Department and Harry L. Garver, Investigator for the Washington Committee on the Relation of Electricity to Agriculture.

Figure 1 shows the foods laboratory of the Experiment Station where the work was done.

Cooking fuels in use in the State of Washington include wood, coal, kerosene, gas and bottled gas, and electricity. Electricity is among the newest of these, and is rapidly becoming the cooking fuel of the Pacific Northwest. Its advantages are many, including cleanliness, ease of operation, speed, and dependability, while the chief objection to its use is the high initial cost of the range and cost of operation. Improved methods of manufacture and modern design have reduced the cost of a new stove to as low as $70.00, while the abundant and cheap hydro-electric power of the Northwest makes the operation of the stove practicable. Under average circumstances the cost of cooking is between three and four dollars per month.

The fact that electric range cooking in Washington is increasing has been shown by reports from the power companies and by a survey made by the College of Home Economics of the State College of Washington. Out of 118 homes in the State studied in 1927, 81 were electrified and 19 had electric stoves; of these same homes in 1929, 93 were wired for electricity, and 36 had electric ranges. A good proportion of rural homes is included in this survey. The power companies report that it is not uncommon to find 50 to 100 new electric ranges installed in one year in an average community.

With this new equipment becoming common in the home, its efficient use has become a problem of importance. Principles for the selection and general use of the electric range are well covered by an Iowa State College bulletin.* Instructions for the use and care of each stove are given by the manufacturer at the time of purchase. Since the cost of electric fuel in many communities is higher than the cost for coal or wood, it is desirable to know the more economical methods of use for the electric range. From the standpoint of cost of operation, then, it is important to know whether baking vegetables in the oven requires less current than boiling them on the surface unit, which oven utensils are to be preferred, what the advantages are to using the oven to capacity, under what oven conditions vegetables can be baked, whether vegetables can be steamed in the oven as successfully as on the surface units, how stored heat can be used to best advantage, and other related problems not here reported.

It is in an attempt to shed light on these problems, and to solve them if possible, that this bulletin has been written.

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* Brigham, Harriet C. "The Electric Range for the Home." Engineering Extension Service, Iowa State College (Ames, Iowa) Bulletin 102, 1929.

SELECTION OF AN ELECTRIC OVEN

In order to have a basis for judging electric ovens, the performance of five of them was tested. They were heated for 15 minutes, the current was turned off, and the ovens were allowed to cool for an hour. During these periods, the temperatures in 15 positions inside of the ovens were being observed and recorded without opening the oven doors. Thermocouples and a pyrometer were used to indicate the temperatures and a watt-hour meter showed the power consumption. The tests were repeated sufficiently to give results that were conclusive.

Points of Selection. From these tests and other observations, the following recommendations are made:

1. An electric oven should be well insulated. Insulated, it is a little slower to pre-heat than a non-insulated oven, but takes less current to maintain the same temperature for a given length of time. One non-insulated oven, after heating 15 minutes, lost nearly 300 degrees Fahrenheit in the first 15 minutes of cooling, while three insulated ovens lost only from 124 to 229 degrees in the same time. This heat loss is particularly undesirable in the summer, for it means a hot kitchen. It is not economical at any time.
2. No oven lining seems to have any definite advantage over another in the matter of distributing the heat evenly throughout the oven. As to ease in keeping clean, the porcelain enamel and chromium-plate are superior to aluminum and aluminized steel.
3. The oven door should close tightly. Even a small crack permits an undue loss of heat from the oven.
4. If the oven is to have a moisture vent, one that is controlled by hand is better than one automatically operated. Many baking operations do not generate any large quantities of steam, and to have the vent always open automatically when the oven is hot is not desirable. In one of the ovens, especially, much heat was lost through the vent.
5. Every electric oven should have a temperature regulator, for economical operation, safety to the stove, and insurance of good products. A temperature indicator also is desirable. To be most useful, both of these devices should have temperatures marked in degrees rather than in arbitrary divisions made by the manufacturer.

SELECTION OF OVEN UTENSILS

The choice of cooking utensils for use in the electric oven was found to be of great importance. Most vegetables require moist heat, and hence a covered utensil is necessary, but just what kind is not so obvious.

There are three common methods of heat transference. These are as follows: (1) conduction, in which the heat travels through some solid or liquid medium, not air, from the source of heat to the body to be heated; (2) convection, in which part of the mass of gas or liquid is heated, moves away from the source of heat and is replaced by cool material which is in turn heated and moves away; and (3) radiation, in which the heat travels directly through space from its source to the body to be heated. Radiation from the hot electric elements is the chief method of heating in the electric oven. Due to the excellent insulation and tightness of joints in most electric ovens, the circulation of air within them is reduced to a minimum, and so convection aids but little in heating the utensil. There is almost no chance for conduction, as the physical contact between the hot elements and the pan is indirect. Radiation, therefore, remains as the most important method of heat transfer in baking.

It was assumed that the best type of utensil would readily absorb radiant heat, and the poorest would reflect heat in that form. Experiments were conducted to determine whether or not this assumption was true. Seventeen pans of aluminum, stainless steel, glass, chinaware (or earthenware), enamel, and Dutch ovens of cast iron and cast aluminum were used.

Each pan was tested in turn by putting in it exactly 1000 grams of water (a little over a quart), covering it, and placing it in an electric oven. A thermocouple adjustment was made so that the temperature of the water could be determined at any time without opening the oven door. The heat was turned on and the observer determined the time required for the water in the pan to reach 200 degrees Fahrenheit. As soon as it did, the heat was turned off, but the pan was left in the oven an hour, to simulate cooking on retained heat. At the end of that time, the pan and water was weighed and the loss of water by evaporation was noted. From these figures, and the amount of power consumed by the range, the efficiency of the pan was cal-

culated. Efficiency is the ratio between the amount of heat that found its way into the pan and its contents, and the amount of heat produced by the current. The major portion of the heat from the current goes toward heating the oven.

Speed and Efficiency of Utensils. Table 1 shows the cost and performance of individual pans of the different materials, and also the average for each group of utensils. These results are shown graphically in Figure 2 for certain of the groups.

The data show that utensils of shiny materials, aluminum and stainless steel, heat more slowly and less efficiently than do utensils of dull or transparent materials like iron, enamel, chinaware, and glass. The heating that occurs in an iron kettle in 26¾ minutes is equal to the heating in an aluminum kettle or pot in 51 minutes. Likewise the efficiency of the iron is almost twice that of aluminum. If iron Dutch ovens are too heavy and unwieldly to use, it can be pointed out that enamel, glass, and china, may be more easily handled and are not much slower or less efficient.

To determine its efficiency when the aluminum ware is less shiny, tests were made with the slowest, shiniest one of the aluminum pans after a heavy coat of soot had been placed on it. The last line of Table 1 shows that water was heated to 200 degrees in 33½ minutes in the blackened aluminum in contrast to 54½ minutes in the same pan when shiny, with an increase of efficiency from 13.1 to 17.7 per cent. The former was thus 40 per cent faster and 35 per cent more efficient than the latter. These results do not mean that aluminum pans should be coated with soot before use, but they do mean that the shinier the ovenware the slower and less efficient it will be. This should be realized by homemakers when they are tempted to scour the outside of oven utensils.

In addition to the theoretical evidence offered here based on water heating experiments, there is further proof of the superiority of dull or transparent utensils obtained in vegetable cooking tests. It has been shown that the same quantity of vegetable, in the same oven at the same temperature, takes longer to reach the same stage of "doneness" in aluminum than in glass, enamel, or chinaware. For instance, turnips and rutabagas that are tender in a 250 degree oven

Table 1. Performance of Oven Utensils (average of several tests)

Utensil	Utensil number	Cost of utensil	Time to heat water to 200°F.	Per cent efficiency
Aluminum	1	$ 1.00	54'30"	13.1
	2	1.00	49'33"	14.2
	3	1.00	49'18"	13.6
	Average		**51'07"**	**13.6**
Aluminum Dutch oven	1	8.00	40'15"	16.7
Stainless Steel*				
Dull	1	12.00	39'22"	15.4
Shiny	2	7.00	54'32"	14.2
Glass	1	2.00	30'10"	22.2
	2	2.00	31'18"	22.7
	3	2.00	32'02"	21.3
	4	2.00	31'10"	21.3
	Average		**31'10"**	**21.9**
China	1	2.36	30'57"	22.0
	2	1.75	30'47"	22.8
	Average		**30'52"**	**22.4**
Enamel	1	1.25	30'10"	18.8
	2	0.98	29'55"	19.5
	3	0.69	29'07"	19.4
	Average		**29'44"**	**19.2**
Cast iron Dutch oven	1	1.50	25'50"	24.4
	2	2.30	27'45"	25.0
	Average		**26'48"**	**24.7**
Aluminum blackened	1	1.00	33'38"	17.7

* Stainless steels are not averaged together because of wide variation between them.

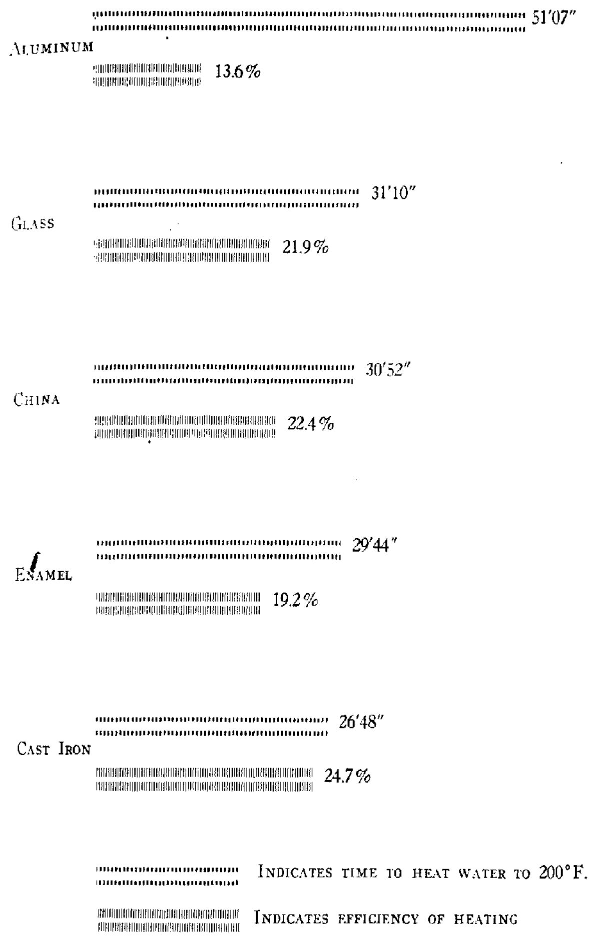

Figure 2. Speed of heating and efficiency of oven materials

in 1¾ hours in glass, are not tender in less than 2¼ hours if cooked in aluminum at the same temperature. Other vegetables baked at other oven temperatures show similar differences in time required for cooking. (See Tables 2 and 3.)

Other Points for Consideration in Selecting Oven Utensils. In addition to speed and efficiency, there are other factors to be considered in the selection of oven utensils. Original cost and durability are important. The tests showed that there is no relation between cost and either speed or efficiency, for some of the more expensive utensils were less satisfactory in performance than the cheaper ones. Durability cannot readily be measured by laboratory experiments. With the best of care, however, any pan should be almost everlasting. If it is to be used carelessly, cast iron, heavy aluminum, and stainless steel will serve best, for glass and china break, and enamel becomes chipped. Any pan that is to be used on the surface units of an electric stove as well as in the oven should not be permitted to become dented in its base for imperfect contact with the electric unit means loss of time and fuel. A pan or casserole should be well balanced and easy to use. Its handles, if it has any, should be well placed, sturdy, and dependable. A compact, squat, little pan is better for oven use than one of the same capacity but flatter and of larger diameter, simply because it takes less room. When an oven meal is being prepared, every inch of space in the oven is valuable. If the pan or casserole has a flat cover so that another utensil can be set on top of it, it becomes more desirable.* The dishwashing required should also be considered. Soap and water ordinarily will be effective for glass, chinaware, and enamel, but iron and aluminum usually require scouring. In addition, when china or glassware casseroles are used for baking, the food can be served directly from the baking dish, saving the washing of a serving dish.

VEGETABLE COOKING

On pages 14, 15, and 16, time tables are given for cooking 14 vegetables in the oven. The vegetables are asparagus, beets, cabbage, carrots, celery, onions, parsnips, peas, Irish and sweet potatoes, rutabagas, spinach, squash, and white and yellow turnips. The following

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* Meat roasted in an electric oven need not be covered during the process.

oven temperatures may be used: 500, 450, 400, 350, 300, and 250 degrees Fahrenheit.

In addition to showing the times required, the tables also show the amounts of water found to be necessary to keep the vegetables from burning in a tightly covered utensil. With old or very strong vegetables, enough water to cover was used, in order to make them palatable. With all others, the aim was to have the water boiled away when the vegetables were done.

These directions should be followed in using Tables 2 and 3.

1. Peel and cut all vegetables except beets into pieces the right size for serving.
2. Use a utensil with a close-fitting cover. This is very important.
3. Use cold water unless hot water is readily available. The vegetable and water can just as well be heated together as to heat the water separately.
4. Use one-half teaspoon of salt, sprinkled evenly over the surface of the vegetable. Cooking in salted water gives the product a more desirable flavor.
5. Cover the pan and put it into a preheated oven. The top unit should be off and the lower unit turned to "high". Be sure the thermostat is set for the desired temperature.
6. Do not open the oven door while cooking, unless absolutely necessary.
7. Fifteen minutes before the end of the time shown in the tables, turn off the current and finish baking on retained heat.
8. The times given in the tables are for about four small servings. If twice as much vegetable is to be cooked, and the temperature used is 400 degrees or higher, increase the time by 5 to 10 minutes. If the temperature used is less than 400 degrees, increase the time given in the table by half. Do not increase the water in either case. Double the amount of salt.
9. If the product obtained from using the tables does not satisfy you, make your corrections right on the tables so that the next time you can profit by your previous experience. The tables were prepared to be guides, not rules.

Table 2. Time Table for Vegetables Cooked in Oven in China, Glass, Enamel, or Iron Utensils*

(First line gives length of time; second, amount of water to be used. Time is given in minutes unless otherwise stated.)

C=cups T=tablespoons t=teaspoons sc=scant

	500°F.	450°F.	400°F.	350°F.	300°F.	250°F.
Asparagus	30	30	35	40†	50†	65†
stalks whole	1/3 C	sc 1/3 C	sc 1/4 C	2 T	1 T	2 t
Beets, whole	1 1/4 hr.	1 1/4-1 1/2 hr.	1 1/2 hr.	2 hr.	2 1/2 hr.	3 1/4 hr.
unpeeled	1 1/2 C	1 1/4 C	1 C	sc C	3/4 C	sc 1/2 C
Cabbage, shredded	†	25	25	30	40	†
coarsely		1/4 C	sc 1/4 C	sc 1/4 C	sc 1/4 C	
Carrots, sliced	45	50	60	75	100-115	2-2 3/4 hr.
lengthwise‡	3/4 C	1/2-2/3 C	sc 1/2 C	1/3 C	1/4 C	1/8-1/4 C
Celery, cut in	30	30-35	35	40	45	†
pieces	sc 1/4 C	1/4 C	sc 1/4 C	1/8 C	sc 1/8 C	
Onions,	40	55	75	100	2 1/4 hr.†	†
quartered	sc 1/4 C	sc 1/4 C	1/4 C	sc 1/4 C	1 t	
Parsnips, sliced	35-40	45	50	60-65	75	1 3/4 hr.
lengthwise‡	sc C	sc C	2/3 C	sc 1/2 C	1/3 C	3 T
Peas, green	30	35	45	55	70†	†
	sc 1/2 C	1/2 C	1/2 C	sc 1/4 C	sc 1/4 C	
Potatoes, peeled	25	30	35	40	50	70
and quartered	sc 1/4 C	1/4 C	1/4 C	1/8-1/4 C	1 T	1 t
Spinach	15	20	20	30	40-45	55†
No water						
Squash	40	45	55	70	90	105
No water						
Turnips or rutabagas, peeled	45-50	50-55	55	60-65	75	105
and cut up‡	1 C	1 C	3/4 C	1/4-1/2 C	1/8 C	1 T

* These figures apply to enough of the vegetables to make four servings.

† Indicates a less desirable product.

‡ Old carrots, parsnips, turnips, and rutabagas should be cooked in enough water to cover.

Table 3. Time Table for Vegetables Cooked in Oven in Aluminum or Stainless Steel Utensils*

(First line gives length of time; second, amount of water to be used. Time is given in minutes unless otherwise stated.)

C=cups T=tablespoons t=teaspoons sc=scant

	500°F.	450°F.	400°F.	350°F.	300°F.	250°F.
Asparagus stalks whole	35 sc ⅓ C	35-40 sc ⅓ C	45 sc ¼ C	50† 3 T	60† 2 T	75† 2 T
Beets, whole unpeeled	1½ hr. 1 C	1¾ hr. 1 C	2 hr. sc C	2¾ hr. ¾ C	3½ hr. ½ C	4½ hr. ⅓ C
Cabbage, shredded coarsely	†	30 ¼ C	30 sc ¼ C	40 sc ¼ C	50 sc ¼ C	†
Carrots, sliced lengthwise‡	45-50 ¼-½ C	50-55 ⅓-½ C	70 ¼-½ C	90-95 ¼ C	2¼-2½ hr. ⅛ C	3-3¾ hr. 2 T
Celery, cut in pieces	40 sc ¼ C	45 ¼ C	50 sc ¼ C	60 ⅛ C	75† 2 T	†
Onions, quartered	50 sc ¼ C	70 sc ¼ C	95 ¼ C	2-2¼ hr. sc ¼ C	3 hr.† 1 t	†
Parsnips, sliced lengthwise‡	40-50 ¾ C	50 ¾ C	55 ½ C	70 sc ½ C	90 ⅓ C	2¼ hr. sc ¼ C
Peas, green	35 sc ½ C	40 ½ C	55 ½ C	75 sc ¼ C	100† sc ¼ C	†
Potatoes, peeled and quartered	30 sc ¼ C	35 ¼ C	40 ¼ C	45 ⅛-¼ C	55 1 T	75 1 t
Spinach No water	20	20-25	25	35	50	70†
Squash No water	40	45	55	75	100	2 hr.
Turnips or rutabagas, peeled and cut up‡	50-55 ½ C	60-65 ½ C	70-75 ⅓-½ C	75-85 sc ⅓ C	100 ⅛ C	2¼ hr. 1 T

* These figures apply to enough of the vegetables to make four servings.

† Indicates a less desirable product.

‡ Old carrots, parsnips, turnips, and rutabagas should be cooked in enough water to cover.

Table 4. Time Table for Vegetables Cooked in Oven without Utensils

(Time is given in minutes unless otherwise stated.)

	500°F.	450°F.	400°F.	350°F.	300°F.	250°F.
Potatoes, whole, unpeeled, medium-large	40	45	50	60	80-90	3-3½ hr.
Squash	40-50	50-55	60-75	1½-1¾ hr.	1¾-2¼ hr.	3-4 hr.
Sweet potatoes, medium-large	30-50	35-55	40-60	50-65	70-85	3-4 hr.

Some Vegetables Should Not Be Baked. Baking of cauliflower, Brussels sprouts, and string beans is not recommended, for these should be cooked quickly in a relatively large quantity of boiling water, uncovered, to give an attractive, palatable product. Baking is a slow process, and the pan must be covered to get good results. Both these factors are detrimental to the flavor and appearance of these vegetables. Cabbage can be baked successfully only if it is considered done while it is still a little crisp. If the cooking period is prolonged until it is very well done, a most unpleasant flavor and odor develop.

Table 4 gives the times required at the different temperatures to bake a few vegetables without the use of utensils. Potatoes and squash are often baked lying uncovered on the oven racks. There is great variation due to differences in size, and allowances for time must be made accordingly.

Baking of Squash. The baking of squash is worthy of special mention. When baked in the usual way, just placed on the oven rack, the product is good at temperatures from 300 to 400 degrees. Below 300 degrees, it dries out before it becomes tender; above 400, it browns too much during the cooking time; however, if the pieces of squash are placed without the addition of water in a utensil and tightly covered, any of the usual temperatures can be used. Even at 500 degrees there is no excessive browning, and at 250 degrees the product does not dry out. At all temperatures, the color, texture, and flavor are better than when squash is baked on the oven rack. The most surprising point of difference is that squash in a covered utensil bakes much more quickly than squash placed on the oven rack. At 300 degrees, without a utensil it requires about two hours,

while squash in a glass casserole needs only an hour and a half at the same temperature. Baking in a covered dish steams the vegetable, while baking on the oven rack dries it out.

Although the work that produced the time tables on pages 14, 15, and 16, was done with electric ovens, there seems to be no good reason why the same figures should not hold for gas ovens with heat regulators. The same temperature, whatever the source of heat, should produce the same result.

Baked vegetables can be served creamed, scalloped, buttered, or in any other way cooked vegetables are commonly used. If they are to be creamed, it is recommended that the cream sauce be made separately on a surface unit and poured over the vegetables just before serving. Scalloping in the oven, however, is easier and saves electricity. If this is done, the time of baking should be lengthened a little to allow for heating the extra liquid used. The utensil should be uncovered for the last fifteen minutes of cooking so that the top may become browned. The best way to butter baked vegetables is to add the butter to the cooked vegetables while they are still in the pan, subsequently returning the pan to the oven for a few minutes to melt the butter.

COST OF OVEN COOKING

Given an efficient electric range with oven and surface units, a utensil suitable for use with either, a time table for using the oven, and a dish of vegetables to be cooked, what method should be used? Which is most economical?

First, do not use the electric oven for the vegetable unless it is already in use for something else. To preheat the oven to 350 degrees and then bake a pan of carrots costs approximately 0.96 kilowatt hours (KWH). To cook the same carrots on a surface unit takes only 0.15 KWH or one-sixth of the cost of baking them. For economical use of the surface unit, the current should be on only long enough to keep the water boiling, most of the cooking being done on retained heat.

The oven can be economically used for steaming or baking vegetables only when it has already been preheated, for the cost of pre-

heating is very high. With two ovens of common makes*, the cost ranges from 0.36 to 0.85 KWH to preheat to temperatures between 250 and 500 degrees. After the oven is heated to 350 degrees, one dish of carrots can be cooked at that temperature with the current on for 60 minutes for 0.42 KWH. Comparing this cost with the 0.15 KWH required for surface unit cooking, it can be seen that keeping the oven hot for an hour for one dish costs nearly three times as much as cooking that one dish over a surface unit. But the advantage comes with the second and third dishes in the oven, for a second can be cooked for an increase of only 0.15 KWH over the first, and the third for a like increase over the second. These figures indicate that if the oven is in use for something, usually a roast, it costs no more to cook carrots in the oven than on a surface unit. With potatoes, steaming in an oven already in use is cheaper than boiling on a surface unit, for the increased cost for each pan in the oven is only 0.06 KWH, compared to 0.11 KWH for cooking on a surface unit.

Oven Meals. The conclusion from the preceding data is that the cost of cooking one item in an electric oven is excessive, but that the nearer the oven is used to capacity, the more economical it becomes. To determine how true this is with oven meals, two different meals were prepared in two ways, and the power consumption for each measured. Each meal included meat and two cooked vegetables. The meals were prepared first by baking as much of them as possible in the oven, and second by roasting only the meat in the oven, and cooking the vegetables on the surface units. With both meals, the oven method revealed a saving of electricity over the other method. This saving amounted to eleven per cent in one case and nine per cent in the other.

If complete oven meals are to be used, baked desserts should be included where possible. No work was done in this project on that subject, but several helpful leaflets are referred to at the end of this paper. The list given there also includes some booklets and articles on the subject of whole oven meals.

* A Hotpoint Automatic Range was used for most of the tests reported in this section, and a Monarch Electric for some.

RECOMMENDATIONS

The more important recommendations to be made from this study are as follows:

1. Before purchase of an electric oven, make certain that it is well insulated, that the door closes tightly, that the moisture vent is not automatic, and that there is a temperature regulator marked in degrees. If possible, buy the range on approval.

2. In purchase of oven utensils, remember that price and performance are not related. Some of the cheaper utensils are faster and more efficient than the more expensive ones, and with care, can be just as durable. If utensils are going to be abused, heavy, unbreakable, and unbendable ware should be purchased. "Waterless" cooking can be done as well in a cheap pan as in an expensive one, if it has a well fitting cover.

3. Many vegetables can be baked, with a very small quantity of water in a covered pan, in such a manner that when the vegetables are done there is no water left. Their flavor and texture are superior to boiled vegetables, and the loss of minerals and vitamins is far less than when cooked in much water and the water discarded.

4. If the electric oven is to be used economically, it should be used to capacity, never for one food alone. Oven meals in which the meat, vegetables, and dessert are prepared at the same time are recommended. In addition to being economical of fuel, such meals are more easily prepared than are surface unit-cooked meals.

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